

ABSTRACT

SEMICONDUCTOR DEVICES

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A power MOSFET (1) has a main current carrying section (MCT) and a sense current carrying section (SCT), with separate source electrodes (s1, s2). The source electrode (s1) of the main section (MCT) is connected to the device source terminal (S1, S2). The source electrode (s2) of the sense section (SCT) is connected through a current sensing resistance (R1) to the same terminal (S1, S2). Both sections (MCT; SCT) have separate gate electrodes (g1, g2). By comparing a reference voltage ( $V_r$ ) with the sense voltage ( $V_s$ ) across the sensing resistance (R1), a first control signal (CS1) is provided for the gate electrode (g2) of the sense section (SCT). Further control means (RG, MDD) comprises an adjustment circuit (RG) coupled to the first control signal (CS1) and to the sense voltage ( $V_s$ ) and provides a second control signal (CS2) to the gate electrode (g1) of the main section (MCT). This second control signal (CS2) maintains the gate-source voltage of the main section (MCT) equal to the gate-source voltage of the sense section (SCT). This corrects the drive to the gate electrode (g1) of the main section (MCT), for reduced drive voltage to the sense section (SCT) due to the sensing resistance (R1).

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Figure 1.

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